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POSTURING TACTICAL ISR BEYOND THE UMBILICAL CORD

by

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Biography

Lieutenant Colonel Keith N. Chauret II graduated from the University of Oklahoma in 1996 with a Bachelor's of Arts in Sociology where he served as the cadet wing commander in the Reserve Officer Training Corps Det 675. He attended Undergraduate Pilot Training at Laughlin AFB, TX and was the first Second Lieutenant to graduate from JSUPT and directly train and receive qualification in the MH-53 Pave Low. In addition to his three assignments in the MH-53, Lt Col Chauret has flown several light fixed wing special operations aircraft throughout his career, flying combat and contingency operations in Afghanistan, Iraq, and Africa with over 1340 combat flying hours in both helicopter assault and light fixed wing Special Operations missions. He served as the Commander of the 318 Special Operations Squadron, Cannon AFB, NM and prior to this assignment he was the Deputy Commander for the 36 Contingency Response Group, Andersen AFB, Guam. He is currently a student at the Air War College at Maxwell Air Force Base, Alabama.

Abstract

Air Force Special Operations Command (AFSOC) has conducted special operations missions across the globe extremely well throughout the years especially when it comes to tactical ISR support with both its remotely piloted fleet of MQ-9s and manned ISR fleet of U-28As and recently acquired MC-12Ws. Each type of platform, either remotely piloted or manned, brings significant enhancements for supporting special operations missions. The well-publicized lethality and precision of the "Drone Strikes" in the Middle-East dominates headlines across the globe while the lesser-known contributions of AFSOCs manned ISR aircraft have also had significant impact on the war on terror. For unilateral strikes that may require long duration persistent ISR, the MQ-9s undoubtedly excel and have a monopoly on this type of mission. Remotely piloted MQ-9s can operate in contested areas without putting any aircrew at risk. Furthermore, crews who can rotate in and out of their operations facility and efficiently provide relief during their long duration missions which helps reduce crew fatigue. However, there are limitations to the MQ-9s capabilities that manned ISR platforms have been mitigating in operations in Iraq, Afghanistan, and Africa for years. When used together, each type (manned and remotely piloted) can capitalize on each other's strengths while overcoming one another's limitations. It is during special operations missions that require "boots on the ground" that we typically see both types of ISR platforms come together to support the operation. This is true when the stakes are high, in particular on a no-fail mission, where ground forces must be committed. Most if not all special operations missions conducted in Afghanistan, Iraq, Syria, and Africa are carried out with both manned and remotely piloted ISR aircraft when special operations forces are on the ground. This concept has been widely successful inside the declared theaters of war for over a decade. There is, however, a gap within the special operations alert posture that is ready to respond to a crisis or contingency anywhere across the globe. Currently,

this alert posture includes the MQ-9 but does not have any manned ISR platforms assigned to it. An emerging crisis that pops up around the globe where a ground force is required should have the full spectrum of manned and remotely piloted aircraft ready to respond with the assault force. Especially where the satellite coverage required for the remotely piloted aircraft's data link may not be established or in the face of a capable enemy that utilizes technology to disrupt or jam the data link. Unlike remotely piloted aircraft, manned aircraft are capable of supporting tactical ISR missions without the need for a beyond line of sight data link. However, AFSOC has not postured any manned aircraft against the alert mission to mitigate the risk associated with remotely piloted aircraft's data link.

AFSOC fills its alert requirements with MQ-9s that are capable of deploying onboard a cargo aircraft anywhere across the globe to support a crisis or contingency mission. As highlighted above there are no manned ISR assigned to the alert posture. This may be due to the fact that neither the U-28A nor the MC-12W is well suited to support the alert mission. This paper will evaluate the capabilities of remotely piloted aircraft like the MQ-9 and the manned aircraft in AFSOC's inventory, the U-28A and MC-12, and make recommendations to fill the void created by the lack of a manned ISR platform assigned to the special operations alert force that is postured to respond rapidly across the globe to take on the nation's interest.

Introduction

Airborne ISR has revolutionized military operations in the past half-century; today it is an essential component of national security planning and operations.[1] The purpose of this paper is to evaluate AFSOC's capabilities to rapidly deploy tactical ISR packages in support of a crisis or contingency anywhere on the globe, especially when supporting a boots on the ground option where special operations teams require airborne ISR over watch and fire support. I will discuss the resources AFSOC currently has in its inventory to support special operations with tactical ISR. I will then compare the capabilities and limitations of AFSOC's manned and remotely piloted tactical ISR platforms to highlight gaps that exist and make recommendations on how AFSOC can best meet its requirement to successfully deploy ISR assets rapidly anywhere globally that special operations forces are required. Of note, this paper will not include analysis on the various handheld drones that may be in operation by special tactics Airmen and instead will focus on the more robust larger aircraft in the inventory that can operate independently of special operations teams on an objective. The ultimate aim will be to determine the right aircraft posture that AFSOC should pursue to meet its requirements to rapidly deploy tactical ISR to support special operations crisis or contingency operations anywhere across the globe.

To begin this evaluation, this paper will first review AFSOC's overall mission, to include any core missions it may list, and determine what AFSOC currently has in its inventory to meet these mission requirements. The AFSOC Mission Statement is quoted below:

> "Air Force Special Operations Command's (AFSOC) mission is to organize, train and equip Airmen to execute global special operations…Anytime…Anyplace. AFSOC provides Air Force special operations forces for worldwide deployment. These forces are highly trained, rapidly deployable, conducting global special operations missions ranging

from precision application of firepower to infiltration, exfiltration, and resupply of SOF operational elements."[2]

AFSOC's Manned and Unmanned Aircraft Inventory

AFSOC is responsible to rapidly deploy ISR in support of special operations missions across the globe and AFSOC has three primary platforms in which it provides tactical ISR capabilities. They include the General Atomics MQ-9 Reaper, the Pilatus U-28A, and the Beechcraft MC-12W. The MQ-9 is a remotely piloted aircraft whereas both the U-28A and the MC-12W are manned. There are currently two squadrons of MQ-9 Reapers in AFSOC; both are stationed at Cannon AFB, NM. There are three U-28A squadrons, with two stationed at Hulburt Field, FL and one at Cannon AFB, NM. The MC-12Ws that are in AFSOC's inventory are part of the 137th Special Operations Wing assigned to Will Rogers Airport as part of the Oklahoma Air National Guard. All three types of aircraft support special operations missions globally. However, according to staff members in AFSOC A5, the MQ-9 is the only ISR platform tasked with the alert mission to deploy rapidly in support of emerging crisis mission. This highlights a potential gap in ISR usage that differs from the current well tested ISR utilization model that combines manned and remotely piloted platforms during boots on the ground special operations missions that I had been part of or witnessed during my sixteen deployments to Afghanistan, Iraq, and Horn of Africa.

There are advantages and limitations of each type of ISR and why the model of combined utilization is pursued when the operation calls for more than a "drone strike." Manned ISR platforms mitigate the gaps inherent with remotely piloted and vice versa which this paper will cover in more depth later. When utilized together, they have significant positive effects on mission success. However, manned ISR assets require much less communications and data

architecture to operate, whereas communications and data are the critical lynchpins to remotely piloted aircraft operations. The advances in technology that can be easily obtained pose a significant threat to the data links required for remotely piloted aircraft. If adversaries derive the means to jam or interfere with the data connection, they are able to impede remotely piloted aircraft from performing their mission. Therefore, ensuring a manned platform that can operate independently of the data link mitigates this risk to the force and overall mission.

There are advantages and limitations of each of the three platforms in AFSOCs inventory and explain why only the MQ-9 up to this point has been the only platform of the three assigned the alert responsibility. Following the evaluation, we will make recommendations on how AFSOC should posture itself to address the need to have a manned ISR aircraft that is rapidly capable of meeting the alert posture for crisis and contingency operations that may arise anywhere across the globe.

MQ-9 Reaper / Remotely Piloted Aircraft Evaluation

As we evaluate all the great things the MQ-9 can achieve and some of its limitations, we will also make some general observations that apply to remotely piloted aircraft systems. Additionally, as a disclaimer, the name associated with remotely piloted aircraft varies significantly amongst those who discuss and write about their capabilities. Some of the sources cited in this section may refer to remotely piloted aircraft as unmanned aircraft, unmanned aircraft system (UAS), or unmanned aircraft vehicle (UAV). For this paper, please consider them interchangeable. Finally, it would also be impossible

USAF Photo
http://www.af.mil/AboutUs/FactSheets/Display/tabid/224/Article/104470/mq-9-reaper.aspx.

to include all the positives and limitations that are associated with remotely piloted aircraft. Further reading on the matter can be found in the 168-page *Unmanned Systems Integrated Roadmap FY2013-FY2038*. It is an excellent source for additional information on remotely piloted aircraft and is referenced on occasion throughout this paper.

As defined by the DoD: An unmanned aircraft system (UAS) is a "system whose components include the necessary equipment, network, and personnel to control an unmanned aircraft." With the retirement of the MQ-1 Predator, the MQ-9 Reaper is the sole remotely piloted ISR platform in AFSOCs inventory. Operated by both the 3rd Special Operations Squadron and 33rd Special Operations Squadron at Cannon, AFB, the MQ-9 is the only AFSOC ISR platform that currently has an alert commitment to rapidly deploy in response to a contingency or crisis anywhere across the globe. It is an accomplished aircraft with a good range and excellent speed. In addition to its visual and signals intelligence sensors, it carries a lethal payload of ordinance for strike and or close air support missions. In fact, world media have discussed the MQ-9's deadly notoriety significantly in the last decade for the "drone strike" missions in Pakistan, Afghanistan, Yemen, and Somalia. It is the perfect persistent ISR platform to identify and follow potential targets, awaiting permissible conditions for a strike.

MQ-9 Reaper General characteristics
Primary function: find, fix, and finish targets
Contractor: General Atomics Aeronautical Systems, Inc.
Power plant: Honeywell TPE331-10GD turboprop engine
Thrust: 900 shaft horsepower maximum
Wingspan: 66 feet (20.1 meters)
Length: 36 feet (11 meters)
Height: 12.5 feet (3.8 meters)
Weight: 4,900 pounds (2,223 kilograms) empty
Maximum takeoff weight: 10,500 pounds (4,760 kilograms)
Fuel capacity: 4,000 pounds (602 gallons)
Payload: 3,750 pounds (1,701 kilograms)
Speed: cruise speed around 230 mph (200 knots)
Range: 1,150 miles (1,000 nautical miles)
Ceiling: Up to 50,000 feet (15,240 meters)
Armament: combination of AGM-114 Hellfire missiles, GBU-12 Paveway II and GBU-38 Joint Direct Attack Munitions
Crew (remote): two (pilot and sensor operator)
Unit cost: $64.2 million (includes four aircraft, sensors, GCSs, and Comm.) (fiscal 2006 dollars)
Initial operating capability: October 2007
Inventory: total force, 93

Data obtained from the USAF Fact Sheet for the MQ-9 http://www.af.mil/AboutUs/FactSheets/Display/tabid/224/Article/104470/mq-9-reaper.aspx.

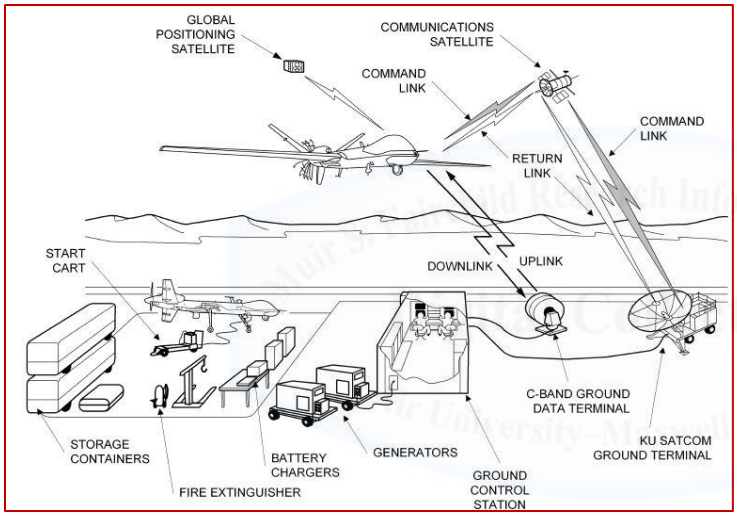
However, like other remotely piloted aircraft, the MQ-9 has some significant limitations and being the sole ISR option on alert for a crisis or contingency can put a special operations task at risk. "Key

challenges all unmanned systems (other than pure autonomous systems) face are the availability of communication links, the amount of data that the communication links support, the assignment of spectrum allocations, and the resilience of all RF subsystems against interference (e.g., electromagnetic)."[3] Unfortunately, our adversaries are working hard to counter the technologies used to control drones. In fact, in 2011 there was a well-publicized case where Iran was able to bring down a U.S. remotely piloted aircraft allegedly by cyber warfare. Iran even posted pictures of the intact drone on TV and in the press to illustrate that the drone was not shot down. Regardless of how that incident occurred, significant research is ongoing by our adversaries to disrupt, jam, and degrade our data links required to control our remotely piloted aircraft. "A critical challenge is that while communication needs continue to increase, degradation from interference also tends to increase at a comparable, if not more accelerated, rate. While it is not an easy task to design a highly sensitive radio receiver that also has a wide dynamic range, communication systems transmission advances without comparable E3 resilience advances will not ensure continuous operations of unmanned systems."[4] If our enemies figure out how to jam our data link signals, or use weapons to destroy the satellites providing the service, our drones would become useless. If this scenario were to occur while actions on the objective were underway by special operations ground forces and there were no backup aircraft capable of flying without the data link, the special operations forces could face a significant risk to mission.

To further compound the data link issues for most remotely piloted aircraft to include the MQ-9, is the fact that these aircraft require a geosynchronous orbiting satellite overhead to provide the connectivity needed for their navigation and communication. Unfortunately, this type of satellite coverage is not readily available everywhere across the globe, and we cannot predict

with pure certainty where the next crisis will emerge. "U.S. military operations are now occurring in many parts of the world where adequate spectrum is not available for C2, sensor, and data link systems."[5] Therefore, AFSOC needs a way to support the airborne ISR requirement when operations occur where there is not satellite coverage for remotely piloted aircraft. A way to mitigate this constraint would be to assign a manned aircraft capable of providing ISR to support rapidly deploying Special Forces responding to crisis situations worldwide.

Latency is another issue facing remotely piloted aircraft. This is the time it takes the data to travel back to the remotely piloted mission suite where the pilots and sensor operators control the aircraft. There is a delay that can be as short as 1-3 seconds long but sometimes a bit longer depending on satellite transmission times and speed. It may not seem like much but when trying to strike a dynamic target, seconds matter and although our highly skilled MQ-9 pilots work hard to overcome the latency of what they are seeing, there is still risk since what they see on their monitors is not real time. In fact, what they are seeing has already occurred. This latency doesn't just compound their targeting, but it has been the cause of numerous pilot induced isolations that degrade aircraft performance and ability to control the aircraft. However, pilots have extensive training on this scenario and have techniques and procedures to regain aircraft control.



Proponents for remotely piloted ISR remind us of why they were created in the first place as the significant advantage that remotely piloted aircraft affords is that the data link provides a

way to take the pilot out of the aircraft and provide safety on long persistent ISR missions in contested areas. However, as we have noted, there are some disadvantages that are inherent with the data link which can pose a risk to mission. “As an essential component of UAS by definition, solutions to problems associated with link spectrum availability, latency, and reliability must be developed in all operating environments.”[6]

Another limitation is the lack of an onboard weather radar that is a common piece of equipment on many manned aircraft. "UAS platforms fly throughout areas of operations on a near-all-weather 24/7 basis at multiple altitudes. These missions require accurate and timely weather forecasts to improve sensors planning and data collection in support of the CCDR and to avoid potential weather-related accidents. Accurate weather reporting also supports complementary ground and flight planning synchronization.”[7] The issue is that many locations across the globe may not have accurate weather reporting facilities and instruments to detect adverse weather. This is true in most parts of Africa, where even historical weather models are not well documented. Therefore having the ability to see the weather in real time from an onboard weather radar can be essential to mission success.

Another aspect we must consider is the sensitive technology onboard ISR aircraft. This doesn’t just apply to remotely piloted aircraft; it is true even for manned aircraft. Allowing the sensitive technology onboard to fall into enemy hands can challenge the technological superiority we now enjoy. Looking back at the well known P-3 aircraft that was forced down in China, if the crew wasn't onboard to zerorize sensitive data, the information loss to the Chinese could have been much worse. "To date, no NSA-approved, type 1–certified DAR encryption devices are suitable for U.S. military operational and/or tactical airborne platforms storing data labeled top secret and secret compartmented information (TS/SCI) and below. The manned

systems community often relies on an emergency destruct plan to ensure physical destruction of classified media, including DAR stored on hard drives, should an operator believe the classified media are at risk of compromise."[8] Unfortunately, if a remotely piloted aircraft was forced down, significant effort will need to be made to retrieve or destroy the aircraft to preserve the sensitive data and equipment located within its airframe. "For UAS, destruction of data becomes an even more challenging endeavor because aircrews are not available to carry out procedures such as an emergency destruct plan. Unmanned programs must rely on autonomous protective measures. Unmanned platforms are required to have an emergency location transmitter that transmits its GPS location to support rapid recovery and/or for coordinates-seeking NLOS weapon targeting for data/vehicle destruction."[9]

Overall, the MQ-9 is a great ISR platform that combines speed with persistent duration and lethal strike. However, there are some significant limitations that may need to be mitigated. One of the more important issues is the preservation and/or accessibility of the data link that may become tougher to overcome as technology becomes available that may impede or degrade remotely piloted operations.

U-28A & MC-12W Evaluation

U-28A USAF Photo
http://www.af.mil/AboutUs/FactSheets/Display/tabid/224/Article/104607/u-28a.aspx.

[10] The U-28A is a highly capable single engine multi-sensor ISR aircraft operated by three squadrons within AFSOC, which include the 34th Special Operations Squadron, the 318th Special Operations Squadron, and the 319th Special Operations Squadron. The U-28A has been in service with AFSOC since 2005 and has been deployed in support of special operations across the globe, mainly in Iraq, Afghanistan, Horn of Africa, and the Philippines. Its contributions have been vast, especially when in support of objectives with special operators in harm's way on the ground. The ability to have multiple visual sensors to provide over watch while simultaneously using another sensor to identify incoming threats to the objective or track adversaries who may try to flee gives it a significant advantage over other ISR platforms that have only one visual sensor. Additionally, the robust voice communications and situational awareness tools inherent with manned aircraft also enhance the performance of the U-28A. When combined with other ISR platforms on an objective, the situational awareness all their visual and signal intelligence sensors provide is a force multiplier that enhances mission success significantly. For example, when boots on the ground options were executed in Iraq, it was not uncommon to have remotely piloted aircraft such as the MQ-9, operating with U-28A's, AC-130 Gunships, other contract fixed wing multi-sensor aircraft, and even fighter aircraft, altogether, each aircraft utilizing their sensors in a well-orchestrated synchronization to enhance the safety and success of the operation. It may seem redundant to have this much capability in the air supporting a single objective, but when you consider the vast training and experience that it took to create the elite special operations,

soldiers who are putting themselves at risk on the objective, it makes sense to mitigate the risk as much as possible to ensure none of those soldiers are lost during the assault. Although air support cannot guarantee their safety and security, it does reduce risk considerably. The concept of employing multiple ISR assets on an objective has become the standard when special operations forces are on the ground. From my experience, both flying tactical ISR aircraft and being the air planner for such operations, the availability of tactical ISR support can be go-no-go risk criteria for the operation. I've not personally seen an objective delay due to lack of ISR support but rather seen ISR support reprioritized to meet requirements of supporting forces on the ground. Many times, developmental objectives would concede their ISR for objectives where special operations forces would conduct ground movements.

U-28A General Characteristics
Crew: 2 Pilots, 1 Combat Systems Officer, 1 Tactical Systems Officer
Builder: Pilatus Aircraft Ltd
Power Plant: Pratt-Whitney PT6A-67B
Thrust: 1,200 horse power
Wingspan: 53 feet 3 inches (16.23 meters)
Length: 47 feet 3 inches (14.4 meters)
Height: 14 feet (4.25 meters)
Speed: 220 knots
Range: 1,500 nautical miles
Ceiling: 30,000 feet
Maximum Takeoff Weight: 10,935 lbs
Deployment Date: 2006
Unit Cost: $16.5 million
Inventory: Active duty, 28; Reserve/ANG, 0

Data obtained from the USAF Fact Sheet for the U-28A http://www.af.mil/AboutUs/FactSheets/Display/tabid/224/Article/104607/u-28a.aspx.

[11] All the success the U-28A have had in combat cannot be overlooked, but there is a reason that it is not tied to the alert mission to rapidly deploy in support of a crisis or contingency operation around the globe. The reason is relatively simple. The U- 28A is not capable of rapidly deploying across the world. With a range of only 1500 miles and a speed of 220 knots, it has its limits. As a former Squadron Commander of the 318th SOS, where I employed the slick or cargo version of the U-28A, the PC-12, I oversaw many OCONUS flights to and from the theaters of operation. From my experience deploying these aircraft to Europe, Africa, Asia, and the Middle East, each deployment was very deliberate due to the speed and range of the aircraft. For

instance, the flight route to Asia went from the Aleutian Islands off of Alaska to Japan. This leg due to the distance and no viable alternates along the way required the best conditions possible. The slightest headwind, or adverse weather at the destination in Japan, could delay the launch for several days. It was not uncommon for a crew to spend several days stuck on the Aleutian Island waiting for conditions to improve to make the long eight-hour flight to Japan. In some cases, the crews would encounter inclement weather along the way and have to turn back and try again on another day. There are other examples across the globe, where the reach of the U-28A can be limited due to range and weather which ultimately preclude it from having it tied to the alert mission in support of an emerging crisis or contingency.

A possible way to mitigate some of the response time may be to have the U-28s forward stationed in Mildenhall with the 352 SOW or in Kadena with the 353 SOG. However, this idea highlights another constraint of the U-28A, which is the demand signal for its use supporting continuous operations in Iraq, Afghanistan, and Africa. AFSOC could purchase additional U-28As to meet this need, but there are other options outside of the U-28A that would be better suited to fit the alert requirement.

MC-12W

MC-12W USAF Photo
http://www.af.mil/AboutUs/FactSheets/Display/tabid/224/Article/104497/mc-12.aspx.

[12] "Project Liberty was considered the fastest delivery of an Air Force weapons system from "concept to combat" since the P-51 Mustang in World War II. The MC-12 is now considered the most heavily tasked manned airframe in the combat Air Force."[13] The tasking's of the MC-12W have been reduced since that statement was made a few years ago with the stand down of Air Combat Command's use of the MC-12W and its hand off to the reserve component of AFSOC. However, this aircraft was set to replace the U-28As in AFSOC, but congressional constraints and budgeting limited the rate and number of aircraft retained by AFSOC and forced the command to continue the service of the U-28A. The increased performance characteristics especially speed and range combined, and dual engine capability makes this platform superior to the U-28A in many ways without sacrificing any sensor or mission support capabilities.

MC-12W Liberty General Characteristics
Primary function: intelligence, surveillance and reconnaissance
Contractor: L-3 Communications
Power plant: Pratt & Whitney PT6A-60A
Wingspan: 57 feet 11 inches (17.65 meters)
Length: 46 feet 8 inches (14.22 meters)
Height: 14 feet 4 inches (4.37 meters)
Weight: 12,500 pounds empty (5,669 kilograms)
Maximum takeoff weight: 16,500 pounds
Fuel capacity: 5,192 pounds (2,355 kilograms)
Speed: 312 knots
Range: approximately 2,400 nautical miles
Ceiling: 35,000 feet (10,668 meters)
Armament: none
Crew: two pilots and two sensor operators
Initial operating capability: June 2009
Unit cost: $17 million (aircraft and all communications equipment modifications)
Inventory: active force, 0; Reserve, 0; ANG, 13

Data obtained from the USAF Fact Sheet for the MC-12W
http://www.af.mil/AboutUs/FactSheets/Display/tabid/224/Article/104497/mc-12.aspx.

However, with the aircraft tied to the Air National Guard in Oklahoma City and not an active duty AFSOC unit, considerable agreements and study would need to be accomplished to gain the authority to utilize this aircraft to meet the alert requirements and rapidly deploy in support of a crisis or contingency operation anywhere across the globe. It

certainly has improved performance over the U-28A to rapidly deploy around the world. With it forward stationed in any of the overseas AFSOC units, its speed in response to a contingency operation can be reduced even greater. However, it does not have the range and speed of a C-17 that the boxed up MQ-9 would have to ensure its timely arrival to a contingency or crisis operation.

Recommendations

Based on the advantages and limitations of the three platforms, MQ-9s, U-28As, and MC-12Ws, AFSOC has in its arsenal to meet the mission requirements to rapidly deploy ISR anywhere across the globe to support special operations crisis or contingency operations I recommend three potential courses of actions for AFSOC's consideration. Any one of which would mitigate the risk to mission inherent with remotely piloted data link reliant airborne ISR. 1. Pursue an ISR capable small manned airplane that can be carried by strategic aircraft or C-130 to meet rapid global deployment timelines; 2. Acquire larger ISR manned aircraft capable of meeting the rapid global deployment timelines across globe; or 3. .Pursue an ISR capable helicopter that can be transported by strategic aircraft or C-130 to meet rapid global deployment schedules. This paper will now analysize at the advantages and disadvantages of these three courses of action to make an overall recommendation on which course of action is best suited to meet AFSOC mission requirements.

Transportable Small Manned Airplane ISR Option

The first option consists of utilizing an ISR strike modified small fixed wing aircraft that could be transported by a C-17 and possibly a C-130 to support emerging crisis or contingency operations around the globe. This course of action would benefit a special operations objective by providing the task force options where the MQ-9 is unable to operate and when paired with the MQ-9 enhance the effectiveness of the operation. For instance, the ability of the light fixed

wing to work independently without the requirement to have beyond line of sight data and communications is a significant advantage it has over the MQ-9. There is no doubt that beyond line of sight data and communication could enhance the light fixed wing option but it would not be go no go criteria to perform its mission. Therefore, it can operate under conditions where a satellite providing the data link is unavailable or under conditions where the enemy or other forces may be jamming and interfering with beyond line of sight data and communications. The light fixed wing option also provides the special operations teams with a more robust communications suite when compared to the MQ-9. The ability of the crew of the light fixed wing to communicate on multiple channels of communication enhances their situational awareness and would make them more useful while operating on an objective. Another advantage for the light fixed wing is that it can carry an onboard weather radar. This would not only benefit the light fixed wing, but the information gathered by this device can be shared with other assets on the objective, to include the crew of the MQ-9 and other airborne platforms that are supporting the mission. The addition of an onboard weather radar would satisfy the weather reporting gaps that are extensive over the continent of Africa, and other parts of the world where ground reporting stations are nonexistent and historical weather trends are not well known. Another advantage the light fixed wing would have over the MQ-9 is that it could mitigate the surface to air threat by incorporating defensive systems onboard that the MQ-9 does not currently possess. However, the light fixed wing just, like the MQ-9, would still be vulnerable from air to air threats.

There are drawbacks to the light fixed wing course of action. One, it would require the stand-up of a new capability. AFSOC would have to source not only the platforms but the crews and maintenance personnel to support such an effort. One way to mitigate some of this would be

to place such a platform in a flying squadron like the 6th Special Operations Squadron where selected crew members can hold multiple crew qualifications, I.E. become checked out in more than one type of aircraft. You could even allocate these aircraft to the MQ-9 squadrons who's crews are extremely familiar with the ISR strike mission. Although the addition of such an aircraft would compete for scarce resources, I.E. the crew members that fly MQ-9s, it could be a huge morale boost for their crews that could be selected to maintain a qualification in both the MQ-9 and the light fixed wing. Additionally, it would add more ease to crossflow of crews between the U-28A and the MQ-9. Finally, the station time, duration on target, would typically be much less that the persistent coverage the MQ-9 could provide.

The light aircraft could be leased or sourced from the Davis Monthan Air Force Base, where many previously utilized aircraft have been preserved. In fact, there are several Bird Dog aircraft available that have been shrink-wrapped and sitting in the desert just waiting to return to service. There are countless other options from the civilian market that could provide sourcing. The second drawback that it shares with the MQ-9 is that these light fixed wing platforms can quickly be engaged in a contested environment.

Again, the significant advantage this course of action would have over other options is the ability to be loaded on board a cargo aircraft such a C-17 that can provide global reach on an accelerated timeline. Additionally, they are typically cheaper to maintain and fly when compared to larger fixed-wing counterparts, and most are incredibly easy to operate as evidenced by aircraft like the Cessna 152 and 172 that serve around the world as training aircraft. AFSOC has a historical president for utilizing light fixed wing aircraft as seen by the aircraft on display in the air park at Hurlburt Field. Return to one of AFSOC's legacy missions would serve the special

operations community well and enhance our effectiveness in a crisis or contingency operation anywhere across the globe.

MQ-9

- C-17 Transportable
- Long Duration / Long Range
- Fast Cruise Speed
- Med – High Altitude
- Armed
- Low Noise Signature
- Single IMMINT Sensor
- Requires BLOS DATA to Operate
- Requires GPS to Navigate
- Limited Voice Comms
- No Defensive Systems
- Unable to See and Avoid
- No Weather Radar
- No Terrain Avoidance System
- Single Engine

ISR Light Fixed Wing

- C-17 Transportable
- Short - Med Duration / Short Range
- Slow Cruise Speed
- Low – Medium Altitude
- Can be Armed to include Machine Guns
- Low Noise Signature
- Can be equipped w/ mult IMMINT Sensors
- Able to operate w/out BLOS DATA & Comm
- GPS enhancing but not required to navigate
- Robust Voice Comms
- Can be equipped w/ Mult Defensive Systems
- Can be equipped w/ TCAS & Weather Radar
- Can be equipped w/ Terrain Avoidance System
- Crew Members can See and Avoid
- Single Engine

Long Range Self-Deployable Manned ISR Option

AFSOC C-146 USAF Photo
Range 1500nm w/ 2000lbs cargo

1415

US Coast Guard Casa 295
Range 2900nm

Similar to the light fixed wing option, the medium fixed wing option provides the ability to operate independently of beyond line of sight satellite communications and data links and would possess all the other advantages of a manned platform. Improved in this option over the light fixed wing is the increased payload, which may result in more onboard sensors to support

the ground forces. Additionally, speed and range are also improved with this option which ultimately results in an increase of station time overhead an objective. However, due to its size, this option would not be able to be transported via C-17 which would necessitate the medium fixed wing to self-deploy.

One of the options available to AFSOC would be the C-146 reconfigured for ISR operations. Reconfiguring could be accomplished with a pod type sensor package or with a permanent modification. The downside with using the C-146 is that these aircraft tend to be tasked extensively and reserving one or two against the alert mission could result in diminished mission support in other areas if the plane were unable to support other commitments. Additionally, the C-146 only advertises a range of 1500nm, which isn't very far considering JFK to London Heathrow is nearly 3,000nm. Which means, the C-146 would require multiple stops along the way, adding considerable time to its response.

Other platform options that have greater range than the C-146 are the MC-12W and Casa 295. The MC-12W although smaller than the C-146 and Casa 295, has a significant range of 2400nm and are currently in AFSOCs inventory under the Air National Guard in Oklahoma. However, 2400nm still falls short of secure transoceanic deployments but is an improvement over the C-146. On the other hand, the aircraft that should be given serious consideration is the Casa 295 that was recently acquired by the U.S Coast Guard. The Casa 295 advertises a range of 2900nm and is capable of in-flight refueling, increasing its range even further. However, all three of these options have a much slower cruise speed averaging around 300 kts, thus limiting their rapid response time.

Forward staging a medium fixed wing at one of AFSOCs overseas bases would reduce their global response time significantly, making any of these a viable option if AFSOC is willing

to resource their acquisition, modification, and basing. In a resource constrained environment, this may not be palatable and place this course of action at a disadvantage when compared to the light fixed wing option.

MQ-9

- C-17 Transportable
- Long Duration / Long Range
- Fast Cruise Speed
- Med – High Altitude
- Armed
- Low Noise Signature
- Single IMMINT Sensor
- Requires BLOS DATA to Operate
- Requires GPS to Navigate
- Limited Voice Comms
- No Defensive Systems
- Unable to See and Avoid
- No Weather Radar
- No Terrain Avoidance System
- Single Engine

ISR Medium Fixed Wing

- Self Deployable (not as fast as C-17)
- Med Duration / Med – Long Range
- Med - Fast Cruise Speed
- Low – Medium Altitude
- Can be Armed
- Low – Med Noise Signature
- Can be equipped w/ mult IMMINT Sensors
- Able to operate w/out BLOS DATA & Comm
- GPS enhancing but not required to navigate
- Robust Voice Comms
- Can be equipped w/ Mult Defensive Systems
- Can be equipped w/ TCAS & Weather Radar
- Can be equipped w/ Terrain Avoidance System
- Crew Members can See and Avoid
- Multiple Engines

Transportable Manned Helicopter ISR Option

MH-60 Ready for transport on C-17
Photo Source
http://www.aircav.com/dodphoto/dod98/mh60-002rs.jpg

407MRH multirole armed ISR (intelligence, surveillance, reconnaissance) helicopter

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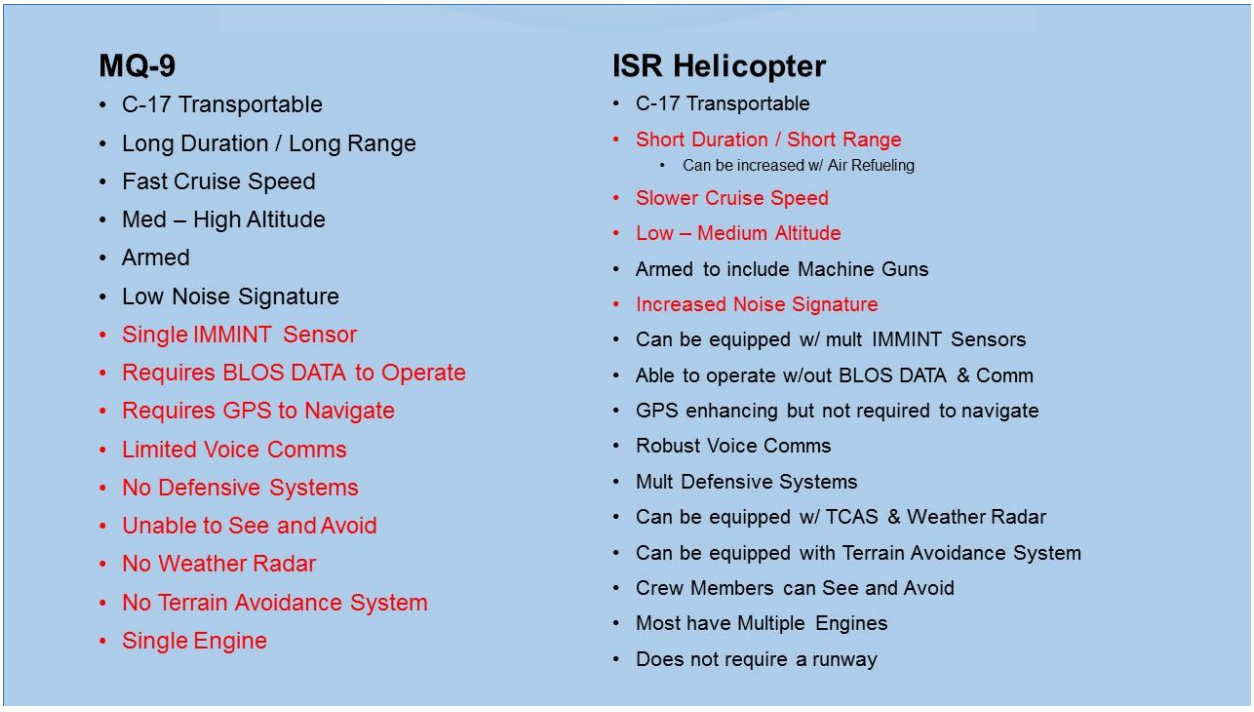
Although AFSOC no longer has any helicopters in its inventory, the concept of having an ISR capable helicopter that could be easily transported anywhere in the world on short notice

should not be overlooked. A manned ISR helicopter would share all the advantages that the fixed wing options provided such that it does not require beyond line of sight satellite data or communications to support special operations teams on an objective. Most helicopters like the MH-60 and 407 pictured above can be armed with similar munitions that the MQ-9 carries and are further enhanced with various types machine guns for additional support. Unlike all the other options, the fact that this one is a helicopter means that it does not require a runway to operate from and could forward deploy away from an intermediate staging base thus providing all the options inherent in rotary wing operations. The downside, of this option, is that typically helicopters have short range and endurance when compared to fixed wing aircraft as well as an increased noise signature that could jeopardize an operation. The range could be mitigated if the helicopter was air refuelable or if a nearby refueling point is established. On the negative side, both steps would add complexity to the operation that may not be merited. Ultimately, this option does provide a capability to assure mission success as well as additional flexibility from a

rotary wing platform but would be better suited for Army Special Operations Aviation rather than AFSOC to pursue if this course of action were selected.

Conclusion

Pairing the MQ-9 with a manned platform provides ISR redundancy in the event the data link has been compromised or disturbed. The manned platform also provides options where the data link does not exist due to poor or no satellite coverage because manned aircraft can operate independently of satellite communications and data links. Furthermore, manned aircraft have increased payload and ability to have more robust communications, to include HF radios for beyond line of sight operation, and ability to house multiple IMMINT and SIGINT sensors. Additionally, manned aircraft have backup navigation tools and training to operate independently of GPS support. Finally, manned aircraft offer better survivability against surface to air threats through their ability to carry defensive systems, and if modified with a weather radar can increase situational awareness for the entire task force. Therefore, adding a manned ISR platform to augment or substitute for the MQ-9 on the alert mission should be considered by AFSOC. The



combined use of manned and remotely piloted ISR on an objective would be in line with how operations have been successfully conducted in Afghanistan, Iraq, and the Horn of Africa over the last fifteen years.

The best option to address the gap in alert capability is the light fixed-wing ISR aircraft transported to the crisis onboard a C-17 or similar long range in-flight refueling capable aircraft. The ISR helicopter solution is also viable, but as AFSOC is no longer in the rotary wing business, this capability would be much harder to stand up within AFSOC and would be better-suited for Army Special Operations Aviation units. As for the medium fixed wing solution, the speed, and range are significantly better than that of the U-28A but not as fast as a light fixed wing option traveling onboard a C-17 to the crisis. Forward staging the medium fixed wings at the overseas bases could be an option but would require significant investment to stand up and resource. I would recommend incorporating the light fixed wing option into the MQ-9 squadrons due to mission similarity. Additionally, having a manned platform would provide further opportunities for progression and aid in crossflowing crewmembers between the U-28 and MQ-9 squadrons. Another option would be to assign the light fixed wing to a unit like the 6th SOS where it is not uncommon for aircrew to hold more than one aircraft qualification.

The light fixed wing would require the ability to be put together quickly and ready for flight in timelines comparable or faster than what it takes to ready the deployable MQ-9 ready for flight. This aircraft would not replace the MQ-9 assigned to the alert posture; it would enhance the capabilities of the ground assault task force by providing an aircraft that is immune or capable of supporting the ground component regardless of the status of beyond line of sight data links and communications. Similar to thousands of successful operations in Iraq, Afghanistan, Syria, Yemen, Philippines, and the Horn of Africa, pairing manned and remotely

piloted ISR provides the ground force the ISR coverage required to reduce risk to their operations. The benefits of having multiple sensors supporting an objective, paired with a manned platform with robust communications and situational awareness overhead the ground force provides redundancy and resiliency critical mission's demand.

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